

CLAIMS

1 1. A coating thickness measuring instrument having a first mode of
2 operation in which the instrument is operative to make measurements with a first
3 resolution and a second mode of operation in which the instrument is operative to
4 make measurements with a second resolution, the first resolution being greater than
5 the second resolution.

1 2. The instrument of claim 1, wherein when the instrument is in the first
2 mode, the instrument is operative to make measurements in a first range and when the
3 instrument is in the second mode, the instrument is operative to make measurements
4 in a second range.

1 3. The instrument of claim 1, wherein when the instrument is in the first
2 mode, the instrument is operative to make measurements in a first range at a high
3 resolution and when the instrument is in the second mode, the instrument is operative
4 to make measurements in a second range at a lower resolution, the second range being
5 longer than the first range.

1 4. The instrument of claim 1, wherein when the instrument is in the first
2 mode, the instrument is operative to make measurements in a first range and when the
3 instrument is in the second mode, the instrument is operative to make measurements
4 in a second range, such that the first range and the second range overlap.

1 5. The instrument of claim 1, further including an inductive probe
2 comprising a drive coil, and two pickup coils.

1 6. The instrument of claim 1, further including an inductive probe
2 comprising a drive coil and two pickup coils; and

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1 a means to drive an alternating current of substantially constant
2 amplitude in the drive coil.

1 7. The instrument of claim 1, further including:

2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means to drive an alternating current of substantially constant
4 amplitude in the drive coil;

5 wherein the means to drive an alternating current comprises an
6 oscillator and associated control loop circuit arranged to control the oscillator in
7 dependence upon current flowing in the drive coil.

1 8. The instrument of claim 1, further including:

2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means to drive an alternating current of substantially constant
4 amplitude in the drive coil; and

5 a means for varying the amplitude of alternating current flowing in the
6 drive coil;

7 wherein the means to drive an alternating current comprises an
8 oscillator and associated control loop circuit arranged to control the oscillator in
9 dependence upon current flowing in the drive coil.

1 9. The instrument of claim 8, wherein the means for varying the
2 amplitude comprises a digitally controlled potentiometer.

10. The instrument of claim 1, further including:

2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means for sensing variation in coupling between the drive and pickup
4 coils and converting the variation in coupling to a thickness value.

1 11. The instrument of claim 1, further including:
2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means for sensing variation in coupling between the drive and pickup
4 coils and converting this to a thickness value;

5 wherein said means for sensing comprises a differential amplifier,
6 means for rectifying the output of the pickup coils and an analog to digital converter.

1 12. The instrument of claim 1, further including:
2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means for sensing variation in coupling between the drive and pickup
4 coils and converting the variation in coupling to a thickness value, said means for
5 sensing comprising a differential amplifier, means for rectifying the output of the
6 pickup coils and an analog to digital converter;

7 wherein the means for rectifying comprises a synchronous detector
8 controlled by a synchronizing signal derived from the means to drive an alternating
9 current in the drive coil.

1 13. The instrument of claim 1, further including:
2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means to modify the amplitude of current flowing in the drive coil
4 in dependence upon output from the pickup coils.

1 14. The instrument of claim 1, further including:
2 an inductive probe comprising a drive coil and two pickup coils; and
3 a means to modify the amplitude of current flowing in the drive coil
4 in dependence upon output from the pickup coils;

5 wherein the means to modify the amplitude comprises a control loop
6 arranged to reduce the amplitude of current supplied to the drive coil as differential
7 output of the pickup coils increases.

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1 15. The instrument of claim 1, further including:
2 an inductive probe comprising a drive coil and two pickup coils;
3 a means to modify the amplitude of current flowing in the drive coil
4 in dependence upon output from the pickup coils; and
5 a switch to enable the control loop to be switched in and out of
6 operation, in order to switch the instrument between the first and second modes;
7 wherein the means to modify the amplitude comprises a control loop
8 arranged to reduce the amplitude of current supplied to the drive coil as differential
9 output of the pickup coils increases.

1 16. The instrument of claim 1, comprising:
2 a microprocessor; and
3 a memory, the memory being operative to store look-up tables for both
4 long and short range modes of operation and the microprocessor being operative to
5 generate a coating thickness value using one of the look-up tables.

1 17. A coating thickness measuring instrument, comprising:
2 an inductive probe having a drive coil and a pickup coil;
3 a means for driving an alternating current in the drive coil;
4 a means for detecting the output of the pickup coil; and
5 a means for modifying the current in the drive coil in dependence upon
6 the output of the pickup coil.

1 18. The instrument of claim 17, wherein the means for modifying the
2 current in the drive coil comprises a control loop which is switchable in and out of
3 operation to provide two modes of operation for the instrument.

1 19. The instrument of claim 18, wherein the means for modifying the
2 current in the drive coil comprises a first control loop which is switchable in and out
3 of operation to provide two modes of operation for the instrument and wherein the
4 means for driving a current in the drive coil comprises a second control loop arranged
5 to maintain the amplitude of current in the drive coil at a substantially constant level.

1 20. The instrument of claim 17, wherein the means for modifying the
2 current in the drive coil comprises a first control loop which is switchable in and out
3 of operation to provide two modes of operation for the instrument and wherein the
4 means for driving comprises an amplitude controlled oscillator and the first control
5 loop is implemented by a current to voltage rectifier, a low pass filter and an error
6 amplifier.

1 21. The instrument of claim 17, wherein the means for modifying is
2 arranged to modify the input to the error amplifier and the amplitude of the current in
3 the drive coil.

1 22. The instrument of claim 17, wherein the means for detecting the output
2 of the pickup coil comprises a synchronous detector.